Dry Bath Heating Systems

Instruction Manual

N2400-4001 Dry Bath Heating System, Single Block, Digital
N2400-4002 Dry Bath Heating System, Dual Block, Digital

www.starlabgroup.com

STAR LAB

DECLARATION OF CONFORMITY

STARLAB declares that the following products:

STARLAB Dry Bath System, Single Block, Digital N2400-4001
STARLAB Dry Bath System, Dual Block, Digital N2400-4002

are, to the best of their knowledge, in compliance with the following directives, standards and other normative documents

ELECTROMAGNETIC COMPATIBILITY
EN61326/1997 + A1/1998 + A2/2001 + A3/2003

EMISSION
CISPR 11/1997 + A1/1999 + A2/2002 Class B,
EN 61000-3-2/2000 & EN61000-3-3/1995 + A1/2001

IMMUNITY
IEC 61000-4-2/2001, IEC 61000-4-3/2002,
IEC 61000-4-4 Ed2/2004, IEC 61000-4-5 Ed2/2005,
IEC 61000-4-6 Ed2.1/2004, IEC 61000-4-11 Ed2/2004

SAFETY
EN61010-1:2001 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements

EN61010-2-010:1996 Laboratory Equipment for the Heating of Materials - Part 1: General Requirements.

Following the provision of Directives 73/23/EEC (Low Voltage) and 89/336/EEC (EMC) as amended by 93/68/EEC (CE Marking)

STARLAB GmbH

TABLE OF CONTENTS

Warning 4

Safety Information 5

Specifications 7

Product Description 7

Product Overview 8

Controls and Features 8

Installation Instructions 9

Operation Instructions 9

Temperature Calibration 10

Troubleshooting Guide 10

Maintenance 11

Ordering information 11

Warranty 11

WARNING

This equipment has been tested and found to comply with the limits for the CE regulation. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. It is strongly recommended that the user reads the following points before this equipment is operated.

1. **Please read and follow the instructions in this manual.**
2. Do not alter the equipment. Failure to adhere to these directions could result in personal and/or laboratory hazards, and invalidate the warranty.
3. Use a properly grounded electrical outlet of correct voltage and current handing capacity.
4. Disconnect from the power supply before maintenance and servicing. Servicing should only be carried out by qualified personnel.
5. In the event that solution is accidentally spilled into the instrument, disconnect from the power supply. You must then carry out appropriate decontamination, for eg. turning the unit upside down to avoid the solution contacting the internal components. Remove bottom cover and inspect to assure solution has not contacted elements, thermostat or connector. Any damaged parts will need replacing.
6. Do not use in the presence of flammable or combustible material; fire or explosion may result. This device contains components, which may ignite such materials.
7. Ensure that the system is connected to electrical service according to local and national electrical codes. Failure to properly connect may create a fire or shock hazard.
8. Ensure the appropriate used materials and correct operation to avoid possible hazards of explosion, implosion or release of toxic or flammable gases arising from the materials being heated.
9. Always use the supplied handle to remove hot blocks, and wear appropriate protection to avoid burning your hand.

ATTENTION: Hot surface!

SAFETY INFORMATION

As with any electrical device, safety precautions need to be taken. Before connecting with the electrical supply, check the voltage is within the range stated at the rating label and that the device is earthed. Place the unit in a safe and dry location. The unit MUST NOT touch anything in the surrounding area. Always follow the safety precautions for chemicals / dangerous materials, and Hot Surface.

Environmental Conditions

Ensure the instrument is installed and operated strictly in the following conditions:
< = 95% RH, 75 KPa-106 Kpa. Altitude must not exceed 2000 meters.

Avoiding Electrical Shock

Please follow the guidelines below to ensure safe operation of the unit.

The STARLAB Dry Bath Heating System has been designed for use with shielded wires, thus minimising any potential shock hazard to the user. STARLAB does not recommend the use of unshielded wires.

1. NEVER connect/disconnect wire leads from the power jacks when the red indicator light on the START button is on, or when "RUNNING" is displayed on the LCD screen.
2. WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
3. ALWAYS make sure that your hands or gloves, the work area and any instruments used, are clean and dry before making any connections or operating the power supply.
4. ONLY connect the power cord to a properly grounded AC outlet.

Avoiding Damage to the Instrument

1. Do not attempt to operate if the unit is damaged in any way.
2. Protect the unit from physical damage, corrosive agents and extreme temperatures (direct sunlight etc).
3. For proper ventilation, the unit should be situated and operated with at least 10cm of clear space behind and at least 5cm of clear space on either side.
4. Do not operate the STARLAB Dry Bath Heating System in high humidity environments (>95%), or where condensation may occur.
5. Before using any cleaning or decontamination method (except those recommended in this manual), you should check with STARLAB or your STARLAB distributor that the proposed method will not damage the equipment.

Equipment Operation

Follow the guidelines below to ensure safe operation of the unit:

1. To avoid significant discrepancies between set temperature and temperature reached, please monitor the displayed temperature regularly eg. by using a calibrated laboratory thermometer. See page 9 "Temperature Calibration" for detailed information.
2. NEVER access any HAZARDOUS LIVE parts.
3. Do not apply lids or covers to any of the tubes being heated in the STARLAB Dry Bath Heating System in order to prevent the possible hazard of explosion and consequent damage.

Symbols

The symbols used on the STARLAB Dry Bath Heating System are explained below.

Danger Electricity: indicates a potential shock hazard may exist.

General Warning: indicates possible personal injury or instrument damage.

ATTENTION: Hot surface!

SPECIFICATIONS

Controller	Digital Microprocessor Controller
Display	Digital
Temperature Control Range	5°C above ambient, to 150°C
Temperature Increase	0.1°C
Temperature Calibration	Yes
Temperature Uniformity	± 0.2°C at 37°C
Temperature Accuracy	± 0.2°C at 37°C
Timer	0 to 999 minutes
Safety Device	Leak-proof heating chamber
Heating Chamber Material	Aluminium
Block Material	Aluminium
Operating Temperature	Ambient – 40°C
Data Log	RS 232 (Maximum 2.5m long)
Power	N2400-4001: 200W; N2400-4002: 300W
Rated Voltages	110 or 220 Volt N2400-4001: 220V AC, 50/60 Hz, 0.63A N2400-4002: 220V AC, 50/60 Hz, 1A
Unit Dimensions	200 x 290 x 80 mm (W x L x H)
Weight	N2400-4001: 2.6kg; N2400-4002: 2.8kg

PRODUCT DESCRIPTION

The single block (N2400-4001) and dual block (N2400-4002) units use interchangeable heating block modules for a variety of applications, including restriction digests, denaturing DNA, BUN, melting agar, coagulation studies, in-situ hybridization and Hot Start thermo-cycler reaction, as well as having the additional function of being used as a water bath. All models incorporate a PID controller for easy temperature selection, rapid heat-up and excellent stability. Temperature may be set in 0.1°C increments, from 5°C above ambient to 150°C. The timer can be set from 0 to 999 minutes for the user's convenience.

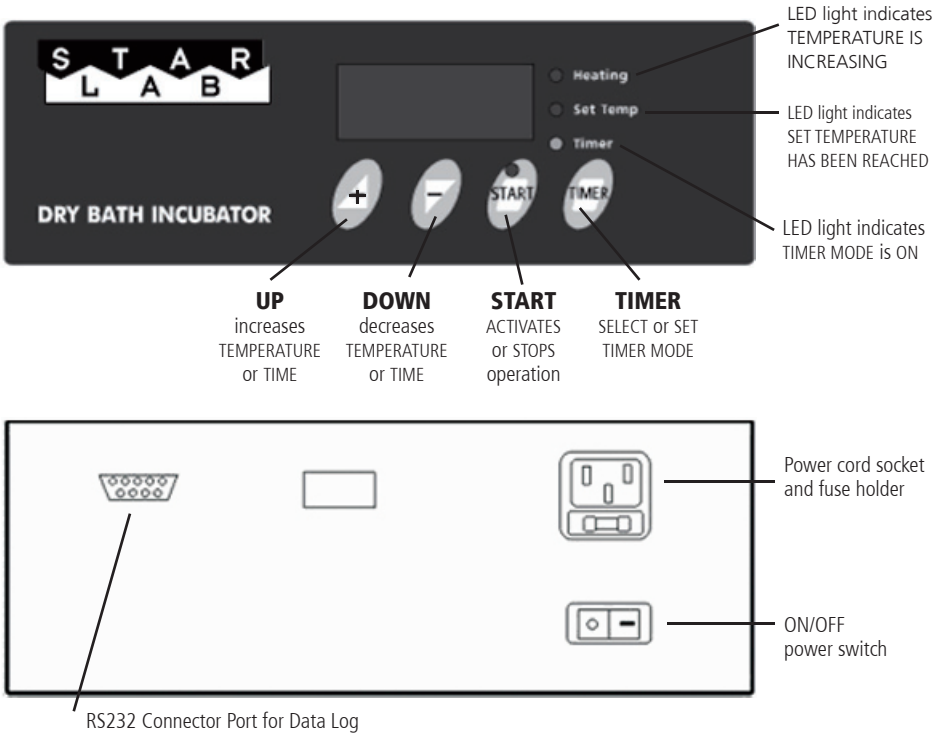
Features

- Digital performance at analog prices
- Microprocessor controller with digital display
- Easy, user calibration
- Leak-proof aluminium heating chamber
- Single and dual block modes

PRODUCT OVERVIEW

STARLAB Dry Bath Heating Systems are designed to cover a wide variety of applications. Excellent temperature control delivers accurate and reliable experimental results, time after time. STARLAB Dry Bath Heating Systems are space-saving, compact instruments, offering great value and convenience for the user. All units comply with CE regulations.

CONTROLS AND FEATURES



INSTALLATION

The STARLAB Dry Bath Heating Systems are ready to 'Plug and Play'. The unit should only be used on a sturdy, level surface in a safe, dry place. Before operation, ensure one or two heating aluminium block(s) is/are inserted into the bath, or if using as a water bath, that water has been added.

OPERATING INSTRUCTIONS

1. Place the unit on a sturdy, level surface in a safe, dry place, away from laboratory traffic.
2. Ensure that the AC power switch is OFF, then plug the power cord into a grounded AC outlet of appropriate voltage (115V or 220V as indicated on the rating sticker near the AC cord on the back of the unit).
3. Select a suitable metal block(s), or the appropriate water volume if using as a water bath, and put into the unit.
4. Turn the AC power ON.
5. Use the UP or DOWN Key to adjust to the desired temperature.
6. Press the START Key to start heating.
7. To change the temperature during heating, press START again to deactivate and set the new temperature. Press START to activate heating.
8. Press the START key again, to stop the unit.

NOTE: If setting the **heating time** is required, press the TIMER Key, and then press the UP or DOWN Key to adjust the time accordingly. The unit will 'auto-stop' when the time is up.

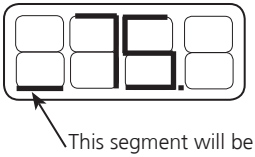
Protection/Error Messages

Error Types	Description
Err1	If the displayed temperature value is 5°C over the set temperature value, Err1 will be displayed, an alarm will sound and the instrument will shut down automatically.
Err2	If the displayed temperature value reaches a temperature much higher than the set temperature value within 1 minute of the unit being switched on, Err2 will be displayed and an alarm will sound. This problem is due to SSR.
Err3	If the internal temperature sensor is broken or a connection problem occurs, Err3 will be displayed; an alarm will sound, and the instrument will shut down automatically.

TEMPERATURE CALIBRATION

The STARLAB Dry Heating System with (optional) metal heating blocks has been calibrated as a set. However, the different kinds of block do not generate the same results. Therefore, for optimum temperature control accuracy, and when changing to different kinds of block, the unit should be calibrated using the procedure outlined below.

1. Insert a calibrated, 45 mm laboratory thermometer into the Thermometer holding port on the block.
2. SIMULTANEOUSLY Press the ON/OFF power switch on the back of the unit and the START Key on the front. During this, the unit will omit a "DU~DU" sound and a LED segment will be flashing (see below). The unit is now in 'Calibration Mode'.



3. Press the UP or DOWN key to adjust the value displayed to the required temperature, then press the START key.
4. Wait for around 40 to 50 minutes until all the LED segments are flashing.
5. Adjust the display value to the same figure as the thermometer, then press the START key.
6. The calibration procedure is now finished.
   Please wait for a few minutes so the microprocessor has time to auto-adjust the temperature, and the LED display value is the same as thermometer.

TROUBLESHOOTING GUIDE

Many operating problems may be solved by reading and following the instructions in this manual. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, contact STARLAB or your STARLAB distributor for assistance.

Problem	Recommendations
LED does not light up	Check the FUSE
	Ensure that the AC power switch is ON
	Check the power cord is properly plugged into a grounded AC outlet of appropriate voltage

MAINTENANCE

The STARLAB Dry Bath Heating System may be cleaned with a moist cloth containing a mild soap solution. The blocks are aluminum and may be cleaned with any of the commercial aluminum cleaners on the market.

ORDERING INFORMATION

Cat. No.	Description
N2400-4001	STARLAB Dry Bath Heating System, Single Block*, Digital
N2400-4002	STARLAB Dry Bath Heating System, Dual Block*, Digital
N2400-4100	Metal Block for 64 x 0.2ml PCR Tubes
N2400-4101	Metal Block for 20 x 1.5/2.0ml Microcentrifuge Tubes
N2400-4102	Metal Block for 12 x 15ml Centrifuge Tubes
N2400-4002	Metal Block for 4 x 50ml Centrifuge Tubes

***** Metal block(s) not included. Metal blocks must be purchased separately

Further Metal Block configurations are available on request. Customised blocks may also be available. Contact STARLAB for details.

WARRANTY

The STARLAB Dry Bath Heating System is under warranty, against defects in materials and workmanship under normal service, for two years from the shipping date to the purchaser. This warranty excludes damages resulting from misuse, carelessness, or neglect. STARLAB's liability under the warranty is limited to the receipt of reasonable proof from the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to STARLAB or a STARLAB Distributor within two years following the date of delivery of the product.

STARLAB GmbH
Kurt-Fischer Straße 22
D-22926 Ahrensburg
Germany

Tel: +49 (0)41 02-6044-0
Fax: +49 (0)41 02-6044-20
Email: info@starlab.de

STARLAB (UK), Ltd
4 Tanners Drive
Milton Keynes MK14 5NA
United Kindgdon

Tel: +44 (0)1908 283800
Fax: +44 (0)1908 283802
infoline@starlab.co.uk

STARLAB-FRANCE
38 Avenue Henri Barbusse
92220 Bagneux
France

Tel: +33 (0)1 45 3652 80
Fax: +33 (0)1 45 3604 86
info@starlab-france.com

STARLAB Srl
Via Corelli 36/5
20134 Milano
Italy

Tel: +39 (0)2 7020 1040
Fax: +39 (0)2 7020 1033
info@starlabitalia.it

STARLAB Scientific India Private Limited
First Floor, Old No. 322, New No. 24
Thambu Chetty Street
Chennai - 600001, India

Tel: +91 (0) 44 421 30702 / 703
Fax: +91 (0) 44 421 30701
info@starlab.co.in

www.starlabgroup.com

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